



| Card Code | Part No<br>37---- | Extender Input<br>Circuit | CM Output<br>Circuit | Collector Loading |     |     | Delays   | (usec) |             |                  |         |             |          | Circuit Use |      |
|-----------|-------------------|---------------------------|----------------------|-------------------|-----|-----|----------|--------|-------------|------------------|---------|-------------|----------|-------------|------|
|           |                   |                           |                      | Circuit           |     |     |          | Per    | Basic Block | Par'lel C'lector | CM Base | Diode Input | 100 uufd |             |      |
|           |                   |                           |                      | 1                 | 2   | 3   |          |        |             |                  |         |             |          |             |      |
| CGWW      | 1251              | No                        | 1                    | Yes               | Yes | Yes | Turn On  | Min.   | .20         | .000             | .000    | .000        | .02      | +O          | -A   |
| CGVW      | 1261              | No                        | 1                    | Yes               | Yes | No  |          | Max.   | .70         | .007             | .015    | .020        | .05      | +OA         | -AO  |
| CGVV      | 1262              | No                        | 1                    | Yes               | No  | No  | Turn Off | Min.   | .06         | .004             | .005    | .000        | .03      | +CA         | -CO  |
| CG--      | 1263              | No                        | No                   | No                | No  | No  |          | Max    | .18         | .010             | .020    | .005        | .06      | -TA         | -TC  |
|           |                   |                           |                      |                   |     |     |          |        |             |                  |         |             |          | -TAO        | -TCO |

### CTDL Two-Way —AND

The CGWW card consists of three two-way PNP logic circuits. Each circuit on the card normally performs a -AND and INVERT logical function and translates a T input to an out-of-phase U output. All three circuits on the card have internal collector loads that provide CTDL outputs at pins H, N, and A and a suitable current-mode output at pin P.

#### Circuit Description (Circuit 1)

The -AND function is performed by the diode mix of D33 and D32 returned to -12 volts, and the INVERT function is accomplished by the transistor circuit. Coincidence of -T levels is required at input pins B and C to forward-bias T1 into saturation. With T1 on, the output at pin H approaches 0v (minus the small voltage drop across the transistor). When either of the input signals increases to +6v, T1 is turned off. The low forward impedance of the conducting logic diode rapidly removes excessive minority carriers from the base region. This action minimizes the effect of operating the transistor in saturation and assures

a fast response at the trailing edge of the output waveform. At this time, the transistor acts as a high impedance, and the output at pin H decreases to -12v (No Load). The 220 ohm resistor limits the output voltage swing at pin P and provides a usable current-mode output.

Because of the large input signals used, input loading conditions do not affect the transistor status. The transistor is either in saturation or at cut-off. Output voltage levels are dependent on loading conditions.

#### Application

Internal collector loading is noted above for the different cap connections in this group of cards. External collector loading is required for the unloaded circuits. Logical functions performed by these circuits are indicated by the symbols listed in the chart, Circuit Use. The NOR functions are accomplished by connecting similar output pins together to share a common collector load. CTDL, current-mode, and voltage-mode outputs are available from these circuits as noted on the schematic.